472

INSTRUCTION MANUAL
MODEL 350

MP MASTER
MA23606

Magnetic AB
Manufacturing Division

STOCKHOLM – BROMMA – SWEDEN

Instruction Manual

for

MICROWAVE POWER DENSITY METER

Model 350

Serial 231.....

Magnetic AB

Stockholm, Sweden

1. Introduction

1.1 The Microwave Power Density Meter model 350 is a portable, battery operated instrument intended for protection of personnel against dangerous microwave radiation. The authorities have settled that 1 mW/cm^2 continuous irradiation and 10 mW/cm^2 temporary irradiation is not to be exceeded. The instrument is therefore equipped with two ranges, 2 mW/cm^2 and 10 mW/cm^2 midscale reading respectively. A non-locking power switch is used to extend the life of the battery.

1.2 Specifications

1.2.1	Frequency range	1.000 - 10.000 Mc/s
1.2.2	Measuring ranges	2 mW/cm^2 and 10 mW/cm^2 midscale reading
1.2.3	Polarization	Vertical, horizontal, right- and left hand circular
1.2.4	Accuracy	$\pm$ 2 dB
1.2.5	Temperature range	-20°C to +40°C
1.2.6	Power source	x/internal Battery 8V Mallory TM-146, Berec PP3 (9V)
1.2.7	Power consumption	130 mW
1.2.8	Weight including case	2 kg

2. Construction

The electrical parts are mounted in an aluminum cabinet. The battery is placed in the handle and is easily exchangeable. The range switch and the two calibration potentiometers are mounted on the back of the cabinet. The zero set control is on the top. In the bottom of the cabinet is a threaded hole (W 1/4") which allows the instrument to be mounted on a camera tripod.

3. Description

The circuit diagram of the instrument is shown on drawing E-35000. The microwave radiation is detected by the broadband antennas which are terminated by thermistors R7T and R8T. The active antennas are perpendicular to each other. The thermistors are connected in series and form one arm of a Wheatstone bridge. The bridge is fed from the battery via

x/ or externally connected 2 x 4.5 V standard dry cells in separate case.

switch S1 and the zero set potentiometer R1. The bridge can be balanced with no incident microwave energy with R1 so that the meter will read zero. When the radiation reaches the antennas the thermistors are heated and their resistance is reduced. The bridge is no longer in balance which can be seen on meter I1. The unbalance is proportional to the incident power so the meter can be calibrated in mW/cm^2.

S2 is the range switch. R2 and R3 are used to calibrate the ranges respectively.

4. Operating Instructions

4.1 Set the range switch in position 20 mW/cm^2.

4.2 Press the push button of the power switch. At first the deflection of the meter is negative but returns in a few seconds to near zero if the instrument previously has been left in a balanced condition.

4.3 Turn the instrument out of the radiation field. (Point the antennas at the ground and turn your back towards the source of radiation.)

4.4 Zero set the instrument by slowly turning the zero set knob. At low temperatures it may be necessary to turn the knob more than normally and then back off when the meter deflects.

4.5 Point the Microwave Power Density Meter towards the source of radiation. Search horizontally and vertically, turn and tilt the instrument slightly and take the maximum reading. If this reading is below 4 mW/cm^2 repeat 4.2-4.5 with the range switch in position 4 mW/cm^2.

Another method which is useful when the zero drifts, due to a poor battery or temperature variation, is to set the pointer a few divisions upscale instead of at zero. The maximum reading is taken as described in paragraph 4.5 and another reading immediately afterwards with the instrument out of the radiation field. The actual power density is then the difference between the two readings.

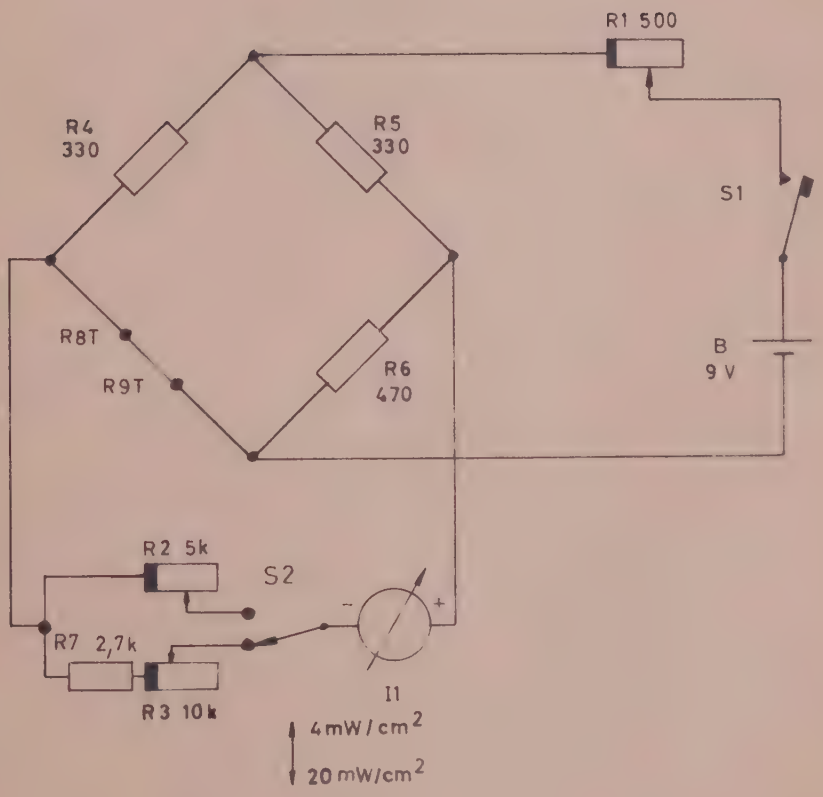
5. Maintenance

The Microwave Power Density Meter model 350 is designed and built to withstand the stresses normally occurring in the field. Like all precision instruments it must be handled with care. To obtain top performance, always use a fresh battery. The battery is easily accessible by pulling the bottom from the instrument handle. Do not leave the battery in the instrument for long periods.

5.1 Calibration

If the reading of the instrument is suspected to be incorrect, due to overloading or careless handling, it has to be re-calibrated. Use a standard gain horn and a power meter. Check the readings at a few frequencies within the frequency range of the instrument. If it is impossible to recalibrate within tolerances by means of the potentiometers R2 and R3, return the instrument to the factory for repair.

DENNA RITNING FÖRBLIVER VÅR EGENDOM, ATT UTAN VÅRT MEDGIVANDE MÅNGFALDIGA, FÖREVISA, UTLÄMNA ELLER ELJEST OBEHÖRIGEN ANVÄNDA DENSAMMA ÄR FÖRBJUDET OCH BEIVRAS MED STÖD AV LAG AV DEN 30 MAJ 1919 SAMT LAG AV DEN 29 MAJ 1931 § 3.



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A 27.3 63	

Det.-nr	Ant.	Benämning	Material	Anm.

Konstr.	Ritad OW	Kop.	Konstr.	Stand.	Godk.	Skala	Ersätter	Erstatt av

MAGNETIC AB
Stockholm Sweden

Microwave Power Density Meter, Model 350, Circuit diagram

Strålningsmätare modell 350 Principschema

Blad

Dat. 8.3 -63

Ritn.-nr 35000

W-tryck, STHLM 5516

Pos. No.	Description	Value	Rating	Tolerance	Manufacturer	Part No.
R 1	Potentiometer	500 Ω	0,5 W	20 %	Dralowid	58 I
R 2	Potentiometer	5 kΩ	0.1 W	10 %	Preh	B201 Linear 6583
R 3	Potentiometer	10 kΩ	0.1 W	10 %	Preh	B201 Linear 6583
R 4	Resistor	330 Ω	0.5 W	5 %	Vitrohm	SBT
R 5	Resistor	330 Ω	0.5 W	5 %	Vitrohm	SBT
R 6	Resistor	470 Ω	0.5 W	5 %	Vitrohm	SBT
R 7	Resistor	2.7 kΩ	0.5 W	5 %	Vitrohm	SBT
R 8T	Thermistor			matched	VECO	32A5
R 9T	Thermistor			pair	VECO	32A5
I 1	Meter				Neuberger	ED40 Special
S 1	Switch, push button				(EKB-prod.)	JET-P
S 2	Switch				MEC	S111
B	Battery				Mallóry 8 V, Berec 9 V or 2 x4, 5 V	TM-146 PP3 Standard

ORDERING REPLACEMENT PARTS

When ordering replacement parts, please specify the following information to assure your getting the right part in the shortest possible time.

1. A complete description of the part, e.g. resistance, tolerance, wattage, capacitance, voltage, etc.

2. Instrument model number and serial number.

3. Component designation, e.g. C 34, in parts list or circuit diagram.

Should, for some reason, this information be unknown, please describe the component as accurate as possible; its function and location in the equipment.

The component delivered as a replacement part may not be exactly like the one mounted originally in the equipment, as our purchasing department buys from at least two different vendors. The manufacturer of the original component may also have improved his product and thereby changed the dimensions. However, the component will work in the instrument it is intended for.

Guarantee

We guarantee to repair or replace free of charge any of the goods, other than consumable material such as valves, lamps and fuses, found to our satisfaction within 12 months after the date of delivery, to be defective owing to faulty workmanship or materials, provided that in the case of goods or component not of our manufacture our liability under this condition is in no circumstances to extend beyond any corresponding liability to us of our supplier.

Any claims must be made within the period of guarantee. We reserve the right to decide what actions shall be taken in case of repair or replacement of parts according to this clause. Under no circumstances shall goods be returned without our consent.

This guarantee does not cover the repair or replacement of any part or parts which fail due to mistakes on the part of operating personnel or of operation of the equipment in a way other than laid down in the operating instructions, or due to fair wear and tear or any other causes not covered by the above guarantee.

RETURN PROCEDURE:

Do not return goods without our written consent. A letter stating the claim should be sent to MAGNETIC AB, Manufacturing Division, Gårdsfogdev. 18, Bromma, Sweden. The failure must be clearly specified and model and serial numer, of the equipment should be carefully noted.

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